



AVIATION



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August 20, 2024

Aviation Investigation Report: AIR-24-05

Define the Meaning and Operational Use of Instantaneous Wind Reports

Introduction

The National Transportation Safety Board (NTSB) is providing the following information to urge the Federal Aviation Administration (FAA) to take action on the safety recommendation in this report. This recommendation is derived from findings from our investigation of a February 2022 airplane accident in which the flight crew attempted to take off in gusting tailwind conditions based on an unsolicited instantaneous wind report provided by air traffic control (ATC); the pilot aborted the takeoff when the airplane would not rotate and it overran the end of the runway. The NTSB is issuing one new safety recommendation to the FAA.

Background and Analysis

On February 21, 2022, a Raytheon Aircraft Company Hawker 800XP airplane, N99AP, overran the end of runway 33 after the flight crew aborted the takeoff in gusting tailwind conditions at Aspen-Pitkin County Airport (ASE) in Aspen, Colorado.¹ The flight crew of the Title 14 *Code of Federal Regulations (CFR)* Part 91 business flight initiated the takeoff based on an unsolicited instantaneous wind report from the ASE ATC tower controller. The instantaneous wind report indicated a wind direction of 180° at 10 knots (kts), which was the airplane's maximum tailwind component for takeoff.² However, the instantaneous wind measurement was recorded by the airport's standalone weather sensor (SAWS) during an apparent lull in the gusting wind conditions and was not representative of other wind reports the flight crew received during the 30-minute period before takeoff. These reports indicated wind speeds as high as 18 kts gusting to 30 kts.³ Just before providing the instantaneous wind report, the tower controller

¹ Visit [ntsb.gov](https://www.ntsb.gov) to find additional information in the [public docket](#) for this NTSB investigation (case number [CEN22LA130](#)). Use the [CAROL Query](#) to search safety recommendations and investigations.

² The captain later reported that "at takeoff clearance, constant winds were reported by tower at [180° at 10 kts] which was within aircraft maximum tailwind takeoff limitation."

³ Runway 15/33 is ASE's only runway. Due to mountainous terrain, takeoffs are not permitted from runway 15.

provided a 2-minute average SAWS wind report to the flight crew that indicated wind speeds at 16 kts gusting to 25 kts.⁴

According to the captain, at the rotation speed (V_R) of 121 kts, he applied back pressure on the yoke; however, the airplane would not become airborne. After a few seconds without any indication the airplane would take off, the captain called for and performed an aborted takeoff by reducing the engines to idle, deploying the thrust reversers, and applying the brakes. The airplane departed the end of the runway and sustained substantial damage; none of the airplane's six occupants was injured.

Postaccident examination of the airplane and flight control system found no anomalies, and findings from an airplane performance study conducted during the investigation indicated that the airplane should have been able to rotate once it reached the reported V_R . Therefore, it is very likely that the airspeed did not reach V_R due to tailwind conditions that exceeded the airplane's maximum tailwind limitation.⁵ The NTSB determined the probable cause of the accident was the flight crew's decision to take off in tailwind conditions that were consistently above the airplane's tailwind limitation, which resulted in a runway overrun following an aborted takeoff. Contributing was the flight crew's use of the instantaneous wind report for the decision to attempt the takeoff.

Operational decision-making at ASE can be challenging because the airport has only runway 33 available for departures. When potentially hazardous wind conditions are present, it is up to pilots to determine whether wind conditions are within limitations of their aircraft, and they rely on wind reports from ATC to make this determination. Following the February 2022 accident, a Part 135 charter company that operates at ASE created and disseminated an informational document about instantaneous wind reports describing how instantaneous wind is measured and the potential hazards of relying on these reports to meet aircraft limitations or performance. The document directs the operator's pilots not to use an instantaneous wind speed "to meet tailwind limitations and/or performance."

Following a fatal 2014 accident at ASE in which the wind report provided to the flight crew was near or exceeded the airplane's performance capabilities, the ASE tower updated its SOPs to require controllers to provide the 2-minute average SAWS wind measurement (see the ASE ATC tower controller wind display in the figure below),

⁴ Other wind reports provided to the flight crew were recorded by the airport's automated surface observing system. In addition to the SAWS and automated surface observing system, ASE has five windsocks located around the airfield.

⁵ The airplane was not equipped with a flight data recorder or any additional data sources that could have captured or reported the airplane's airspeed during the attempted takeoff.

including any wind gust information, to “all aircraft in lieu of any other wind information.”⁶ The SOPs also stated that this information, which it defined as “the official wind,” could be supplemented with the SAWS instantaneous wind measurement if a pilot requests it or “in the judgment of the controller.”⁷ According to the ASE air traffic manager, many business pilots are familiar with and follow the procedure for requesting instantaneous wind reports. He noted, however, that other pilots who do not frequently fly at ASE may be unfamiliar with the procedure.

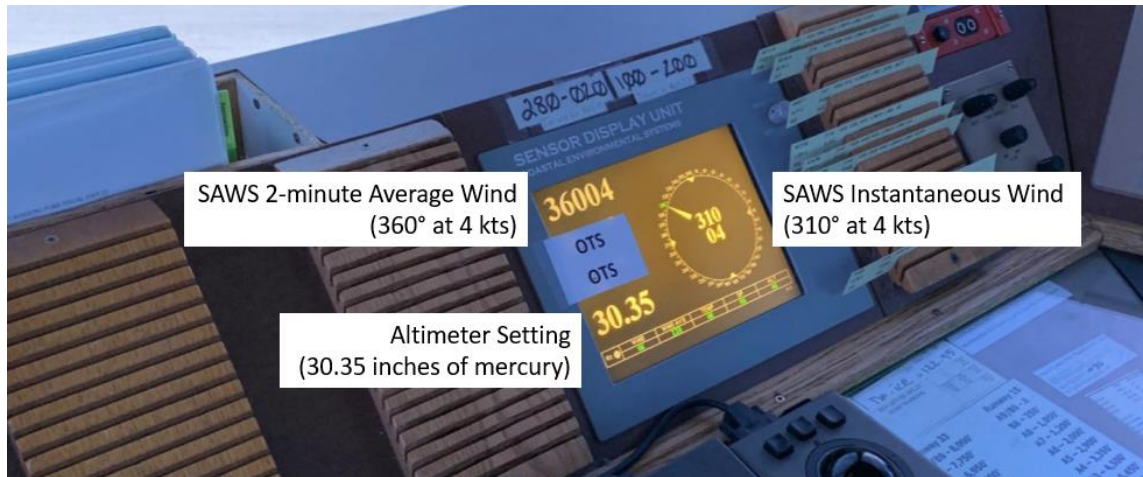


Figure. SAWS 2-minute average wind and instantaneous wind displays in the ASE ATC tower.

As part of the February 2022 accident investigation, the FAA stated that it would not be feasible to determine how many of the 526 airports in the National Airspace System (NAS) are equipped to measure instantaneous wind or have SOPs that address how such measurements should be used. It is therefore unknown how many airports in the NAS measure instantaneous wind or provide instantaneous wind reports to pilots. Further, as noted in the NTSB’s final report concerning the February 2022 accident at ASE, although the term “instantaneous wind” is used by the airport’s ATC personnel, it is not defined in any FAA publication. Lacking such definition or guidance, the accident flight crew interpreted the instantaneous wind provided by ATC just before takeoff as the constant wind conditions.

⁶ (a) The NTSB determined the probable cause of the accident was the flight crew's failure to maintain airplane control during landing following an unstabilized approach. Contributing to the accident were the flight crew's decision to land with a tailwind above the airplane's operating limitations and their failure not to conduct a go-around when the approach became unstabilized. For more information about this investigation, see case number [CEN14FA099](#) at the NTSB’s website. (b) According to the ASE air traffic manager, the wind gust information provided represents the highest gusts recorded by SAWS in the last 10 minutes.

⁷ Before this update to the ASE tower’s SOPs, providing the official wind report was at the controllers’ discretion.

The NTSB concludes that an official definition of instantaneous wind and guidance on its use during flight operations would facilitate pilots' decision-making when operating in potentially hazardous wind conditions. Therefore, the NTSB recommends that the FAA define the term "instantaneous wind" and develop guidance for pilots on proper use of an instantaneous wind report in operational decision-making.

Conclusion

Finding

An official definition of instantaneous wind and guidance on its use during flight operations would facilitate pilots' decision-making when operating in potentially hazardous wind conditions.

Recommendation

New Recommendation

As a result of this investigation, the National Transportation Safety Board makes the following new safety recommendation.

To the Federal Aviation Administration:

Define the term "instantaneous wind" and develop guidance for pilots on proper use of an instantaneous wind report in operational decision-making. (A-24-26)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

JENNIFER HOMENDY
Chair

MICHAEL GRAHAM
Member

THOMAS CHAPMAN
Member

ALVIN BROWN
Member

J. TODD INMAN
Member

Report Date: August 20, 2024

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For more detailed background information on this report, visit the NTSB investigations website and search for NTSB accident ID CEN22LA130. Recent publications are available in their entirety on the NTSB website. Other information about available publications also may be obtained from the website or by contacting—

National Transportation Safety Board
Records Management Division, CIO-40
490 L’Enfant Plaza, SW
Washington, DC 20594
(800) 877-6799 or (202) 314-6551